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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte JOHN SIEVERS, STEPHEN BOTZKO, DAVID LINDBERGH, and CHARLES M. CRISLER

Appeal 2009-014870
Application 10/798,519[1]
Technology Center 2400

Before MAHSHID D. SAADAT, DENISE M. POTHIER, and MICHAEL R. ZECHER, *Administrative Patent Judges*.

ZECHER, *Administrative Patent Judge*.

DECISION ON APPEAL

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[1] Filed March 11, 2004. The real party in interest is Polycom, Inc. Br. 3.

I. STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134(a) (2002) from the Examiner's rejection of claims 1-33. Br. 3.[2] We have jurisdiction under 35 U.S.C. § 6(b) (2008).

We affirm.

Appellants' Invention

Appellants invented a method and apparatus directed to a technique in which a video encoder, using information communicated from either a decoder or from prior knowledge (e.g., a published specification), determines a model of the decoder's computational load and adjusts its encoding dynamically in response thereto. Spec. ¶ [0009].

Illustrative Claims

> 1. A method of quality-improvement of a digitally encoded video sequence, wherein the video sequence comprises information representing a sequence of encoded frames, each encoded frame comprising one or more encoded macroblocks, the method comprising:
>
> determining one or more processing capabilities of a decoder that will decode the video sequence;
>
> encoding macroblocks of a first image;
>
> encoding macroblocks of subsequent images, wherein some macroblocks are skipped;
>
> and increasing video quality as a function of a fraction of macroblocks that are skipped to take advantage of decoder processing capability that would otherwise be unused as a result of the skipped macroblocks.
>
> 22. A method of quality-improvement of a digitally-encoded video sequence, the method comprising:
>
> determining one or more processing capabilities of a decoder that will decode the video sequence; and

[2] All references to the Brief are to the Brief filed on February 9, 2009.

increasing video quality as a function of an encoder model of decoder processing load to take advantage of decoder processing capability that would otherwise be unused.

Prior Art Relied Upon

Sekiguchi	US 2005/0041740 A1	Feb. 24, 2005 (PCT filed Apr. 9, 2003)
Brooks	US 7,114,174 B1	Sept. 26, 2006 (filed Feb. 10, 2000)

Rejections on Appeal

Claims 22-27, 30, and 31 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Brooks. Ans. 3-4.

Claims 1-21, 28, 29, 32, and 33 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Brooks and Sekiguchi. *Id.* at 4-9.

Appellants' Contentions

1. Appellants contend that Brooks does not describe an encoder that determines processing capabilities of a decoder, as required by claims independent 22 and 27. In particular, Appellants argue that while Brooks discloses that the encoder receives specified parameters requested by the decoder, these parameters are not the decoder's processing capabilities. Appellants allege that while it may be obvious that Brooks' decoder is capable of processing video encoded in any number of ways, the parameters transmitted to the decoder are only one example of what the decoder is capable of processing. Br. 6.

Further, Appellants contend that Brooks does not describe that the encoder increases video quality as a function of an encoder model of decoder processing load to take advantage of decoder processing capability

that would otherwise be unused, as required by independent claims 22 and 27. In particular, Appellants argue that since Brooks discloses that the encoder will only send what is requested by the decoder, Brooks does not describe increasing video quality except in response to the encoder sending new parameters indicating how the video should be encoded. Moreover, Appellants allege that the process of sending new parameters is not in response to an encoder module of decoder processing load, as claimed. *Id.*

2. Appellants contend that Brooks' discussion of manipulating a video stream to meet a target output color depth, resolution, and frame rate does not teach or suggest "determining one or more processing capabilities of a decoder . . . ," as recited in independent claims 1 and 15. In particular, Appellants argue that the textual portion of Brooks relied upon by the Examiner only teaches or suggests a method of transcoding video that includes techniques for matching the input video stream parameters to the specified output parameters given to a transcoder. Br. 8.

Further, Appellants allege that since Brooks' disclosure at column 3, lines 8-14 is entirely silent with respect to macroblock skipping, Brooks cannot teach or suggest "increasing video quality as a function of a fraction of macroblocks that are skipped . . . ," as recited in independent claim 1, and similarly recited in independent claim 15. Br. 8. Moreover, Appellants contend that Sekiguchi's disclosure of determining a coding mode does not amount to an increase in video quality, but rather only teaches or suggests a selecting a technique that most efficiently represents the data that is to be encoded. Therefore, Appellants argue that Sekiguchi also does not teach or suggest "increasing video quality as a function of a fraction of macroblocks that are skipped . . . ," as claimed. Br. 9.

Examiner's Findings and Conclusions

1. The Examiner finds that Brooks discloses a system for transforming streaming video data, wherein the data associated with output video data is typically derived from a requesting device. Further, the Examiner finds that Brooks discloses that the requesting device informs the gateway system as the bandwidth requirements, which may include maximum frame rate, color-depth, screen resolution or spatial bandwidth, maximum bit rate, and the like. In particular, the Examiner finds that Brooks discloses numerous example of tailoring the bitstream to the capabilities of the decoder, such as scaling the color bit depth from 8 bits to 10 bits. Consequently, the Examiner finds that Brooks describes determining one or more processing capabilities of a decoder, and increasing video quality as a function of an encoder model of decoder processor load to take advantage of decoder processor capability that would otherwise be unused, as required by independent claims 22 and 27. Ans. 10.

2. The Examiner references his analysis with respect to independent claims 22 and 27, and reiterates his position that Brooks teaches or suggests "determining one or more processing capabilities of a decoder . . . ," as recited in independent claims 1 and 15. Ans. 11. Moreover, the Examiner finds that Brooks' disclosure of adjusting the quantization scale to meet an optimized target bit rate, in conjunction with Sekiguchi's disclosure of a coding mode estimator choosing a coding mode based on the presence of skipped macroblocks, teaches or suggests "increasing video quality as a function of a fraction of macroblocks that are skipped . . . ," as recited in independent claim 1, and similarly recited in independent claim 15. Ans. 11-12.

II. ISSUES

1. Did the Examiner err in finding that Brooks describes the following claim limitations recited in independent claim 22, and similarly recited in independent claim 27:

(a) "determining one or more processing capabilities of a decoder . . . ;" and

(b) "increasing video quality as a function of an encoder model of decoder processing load to take advantage of decoder processing capability that would otherwise be unused"?

2. Did the Examiner err in finding that the combination of Brooks and Sekiguchi teaches or suggests the following claim limitations recited in independent claim 1, and similarly recited in independent claim 15:

(a) "determining one or more processing capabilities of a decoder . . . ;" and

(b) "increasing video quality as a function of a fraction of macroblocks that are skipped to take advantage of decoder processing capability that would otherwise be unused as a result of the skipped macroblocks"?

III. FINDINGS OF FACT ("FF")

Brooks

FF 1. Brooks discloses transforming video streams. In particular, Brooks discloses adapting input streams of video data to meet desired parameters for output streams of video data. Brooks discloses that adapting

desired output parameters on the fly may include changing the display size, frame bite, bit-depth, bit rate, encoding format, and the like. Col. 3, ll. 9-14.

FF 2. Brooks discloses deriving the data associated with output video data from a requesting device. For example, Brooks' figure 1 illustrates that when a requesting device contacts the gateway system (100), the requesting device will also inform the gateway system (100) as to its bandwidth requirements. Brooks discloses that the bandwidth requirements may include maximum frame rate, color-depth, screen resolution or spatial bandwidth, maximum bit rate, and the like. Col. 10, ll. 1-11.

FF 3. Brooks' figures 6A and 6B illustrate a transcoding process. Col. 17, ll. 23-25. At step 830, when the input color depth is smaller than the desired output color depth, Brooks discloses scaling the input frame of data to the output color depth. For example, if the input color depth is 8 bits and the desired output bit depth is 10 bits, Brooks discloses scaling up the input frame bit depth to 10 bits. Col. 17, ll. 50-55.

Sekiguchi

FF 4. Sekiguchi's figure 7 illustrates a monitoring operation in the MPEG-2 coding mode of a coding mode estimator (8). ¶ [0126]; *see also* figure 1. At step ST0, Sekiguchi discloses that the coding mode setting information (12) output from the coding mode estimating section (8) includes three possible choices: forces INTRA mode, forced SKIP mode, and INTER mode. ¶ [0129]; *see also* figure 1. Only when a decision is made to check the INTER mode does Sekiguchi disclose re-deciding the optimum mode in terms of coding efficiency among the possible MPEG-4 coding modes. ¶ [0130].

IV. ANALYSIS

35 U.S.C. § 102(e) Rejection—Brooks

Claims 22 and 27

We do not find error in the Examiner's anticipation rejection of independent claims 22 and 27. In particular, independent claim 22 recites, *inter alia*: 1) "determining one or more processing capabilities of a decoder . . . ;" and 2) "increasing video quality as a function of an encoder model of decoder processing load to take advantage of decoder processing capability that would otherwise be unused."

At the outset, we agree with the Examiner that Brooks discloses a system for transforming video streams that derives data associated with output video data from a requesting device. FFs 1 and 2; *see also* Ans. 10. We also agree with the Examiner that Brooks discloses that the requesting device informs the gateway system of its bandwidth requirements, which include desired output parameters such as maximum frame rate, color-depth, screen resolution or spatial bandwidth, and maximum bit rate. *Id.* Consequently, we find that Brooks' gateway system uses one or more desired output parameters transmitted from the requesting device to determine the processing capabilities of such device. Thus, we find that Brooks describes "determining one or more processing capabilities of a decoder...," as recited in independent claims 22 and 27.

Moreover, we find Brooks' gateway system uses the desired output parameters transmitted from the requesting device to dynamically regulate the output video data. FF 1. In particular, Brooks discloses that the gateway system can regulate or tailor the frame rate of input video data using the desired color depth of the requesting device. FF 3. That is, if the input

video data has a color depth of 8 bits and the desired output bit depth of the requesting device is 10 bits, Brooks discloses that the gateway system may scale up the frame bit depth of the input video data to 10 bits. *Id.* Consequently, we find that Brooks discloses that the gateway system is capable of increasing the video quality (i.e., color depth) as a function of the requesting device's processing load in order to take advantage of the requesting device's processing capabilities (i.e., desired or maximum color depth) that would otherwise be unused. Thus, we find that Brooks describes "increasing video quality as a function of an encoder model of decoder processing load to take advantage of decoder processing capability that would otherwise be unused," as recited in independent claim 22, and similarly recited in independent claim 27. It follows that the Examiner has not erred in finding that Brooks anticipates independent claims 22 and 27.

Claims 23-26, 30, and 31

Appellants do not provide separate and distinct arguments for patentability with respect to dependent claims 23-26, 30, and 31. *See* Br. 5-7. Consequently, based on Appellants' grouping of dependent claims 23-26, 30, and 31 with independent claims 22 and 27 (*id*), dependent claims 23-26, 30, and 31 fall with their representative claims. *See* 37 C.F.R. § 41.37(c)(1)(vii).

35 U.S.C. § 103(a) Rejection—Combination of Brooks and Sekiguchi

Claims 1 and 15

We do not find error in the Examiner's obviousness rejection of independent claims 1 and 15. In particular, independent claim 1 recites, *inter alia*: 1) "determining one or more processing capabilities of a decoder . . . ;" and 2) "increasing video quality as a function of a fraction of

macroblocks that are skipped to take advantage of decoder processing capability that would otherwise be unused as a result of the skipped macroblocks."

As set forth *supra*, Brooks discloses a gateway system that uses one or more desired output parameters transmitted from a requesting device to determine the processing capabilities of such device and, therefore, teaches or suggests "determining one or more processing capabilities of a decoder . . . ," as recited in independent claims 1 and 15. Moreover, while Brooks discloses that the gateway system is capable of increasing the video quality as a function of the requesting device's processing load (FF 3), we agree with the Examiner that Brooks is silent with respect to whether increasing video quality is a function of macroblock skipping. *See* Ans. 11. However, we find that Sekiguchi teaches or suggests a coding mode estimator that chooses an optimal coding mode based on the presence of skipped macroblocks in a video frame. FF 4.

Accordingly, we find that an ordinarily skilled artisan would have found it obvious to incorporate Sekiguchi's coding optimization that takes into account the presence of skipped macroblocks (FF 4), into Brook's gateway system that is capable of increasing video quality. FF 3. Such combination of known elements predictably results in a more robust system that handles data changes and, consequently, increases the video quality as a function of skipped macroblocks in order to take advantage of a requesting device's processing capabilities that would otherwise be unused as a result of the skipped macroblocks. *See* Ans. 5. Thus, we find that the combination of Brooks and Sekiguchi teaches or suggests "increasing video quality as a function of a fraction of macroblocks that are skipped to take advantage of

decoder processing capability that would otherwise be unused as a result of the skipped macroblocks," as recited in independent claim 1, and similarly recited in independent claim 15. It follows that the Examiner has not erred in concluding that the combination of Brooks and Sekiguchi renders independent claims 1 and 15 unpatentable.

Claims 2-14, 16-21, 28, 29, 32, and 33

Appellants do not provide separate and distinct arguments for patentability with respect to dependent claims 2-14, 16-21,[3] 28, 29, 32, and 33. *See* Br. 7-9. Consequently, based on Appellants' grouping of dependent claims 2-14, 16-21, 28, 29, 32, and 33 with independent claims 1 and 15 (*id*), dependent claims 2-14, 16-21, 28, 29, 32, and 33 fall with their representative claims. *See* 37 C.F.R. § 41.37(c)(1)(vii).

V. CONCLUSIONS OF LAW

1. The Examiner has not erred in rejecting claims 22-27, 30, and 31 as being anticipated under 35 U.S.C. § 102(e).

2. The Examiner has not erred in rejecting claims 1-21, 28, 29, 32, and 33 as being unpatentable under 35 U.S.C. § 103(a).

[3] Note that claim 17 depends from itself. *See* Br. 13.

VI. DECISION

We affirm the Examiner's decision to reject claims 1-33.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

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